CLAIMS

What is claimed is:

1. A semiconductor package with a photosensitive chip, comprising:

a substrate having a core with a plurality of conductive traces formed on at least one surface of the core, each of the conductive traces having a terminal, wherein a solder mask layer is applied over the surface of the core and covers the conductive traces, allowing the terminals to be exposed to outside of the solder mask layer, and the solder mask layer is formed with an opening to expose a peripheral portion on the surface of the core;

at least one photosensitive chip mounted on the substrate and electrically connected to the exposed terminals of the conductive traces;

an encapsulation dam formed on the peripheral portion of the core and surrounding the chip, wherein the dam comprises a shoulder portion adjacent to and flush with the solder mask layer, and a protruded support portion surrounding the shoulder portion and having a height larger than a thickness of the chip; and

a lid attached to the support portion of the dam for sealing the dam such that the chip is received in a space defined by the substrate, the dam and the lid.

2. The semiconductor package of claim 1, further comprising a plurality of solder balls implanted on a side of the substrate opposite to the side mounted with the chip.
3. The semiconductor package of claim 1, wherein the shoulder portion of the dam has a width of from 0.1 to 1 mm.
4. The semiconductor package of claim 3, wherein the width of the shoulder portion is 0.5 mm.
5. The semiconductor package of claim 1, wherein each of the terminals serves as a bond finger where a bonding wire is bonded to electrically connect the chip to the substrate.

6. The semiconductor package of claim 1, wherein the core is made of a material selected from the group consisting of epoxy resin, polyimide resin, BT (bismaleimide triazine) resin, and FR4 resin.
7. The semiconductor package of claim 1, wherein the dam is made of a resin compound.
8. A fabrication method of a semiconductor package with a photosensitive chip, comprising the steps of:

preparing a substrate having a core with a plurality of conductive traces formed on at least one surface of the core, each of the conductive traces having a terminal, and applying a solder mask layer over the surface of the core to cover the conductive traces, allowing the terminals to be exposed to outside of the solder mask layer, wherein the solder mask layer is formed an opening to expose a peripheral portion on the surface of the core;

forming an encapsulation dam on the peripheral portion of the core, wherein the dam comprises a shoulder portion adjacent to and flush with the solder mask layer, and a protruded support portion surrounding the shoulder portion and forming a space encompassed by the dam;

mounting at least one photosensitive chip on the substrate and in the space encompassed by the dam, and electrically connecting the chip to the exposed terminals of the conductive traces; and

attaching a lid to the support portion of the dam to seal the space such that the chip is received in the space encompassed by the dam, the substrate and the lid.

9. The fabrication method of claim 8, further comprising implanting a plurality of solder balls on a side of the substrate opposite to the side mounted with the chip.
10. The fabrication method of claim 8, wherein the shoulder portion of the dam has a width of from 0.1 to 1 mm.

11. The fabrication method of claim 10, wherein the width of the shoulder portion is 0.5 mm.

12. The fabrication method of claim 8, wherein each of the terminals serves as a bond finger where a bonding wire is bonded to electrically connect the chip to the substrate.

13. The fabrication method of claim 8, wherein the core is made of a material selected from the group consisting of epoxy resin, polyimide resin, BT (bismaleimide triazine) resin, and FR4 resin.

14. The fabrication method of claim 8, wherein the dam is made of a resin compound.

15. A fabrication method of a semiconductor package with a photosensitive chip, comprising the steps of:

preparing a substrate plate comprising an array of substrates, the substrate plate having a core with a plurality of conductive traces formed on at least one surface of the core, each of the conductive traces having a terminal, and applying a solder mask layer over the surface of the core to cover the conductive traces, allowing the terminals to be exposed to outside of the solder mask layer, wherein the solder mask layer is formed with an opening to expose a peripheral portion on the surface of the core for each of the substrates;

forming an encapsulation body comprising a plurality of interconnected encapsulation dams each on the peripheral portion of the corresponding substrate, wherein each of the encapsulation dams comprises a shoulder portion adjacent to and flush with the solder mask layer, and a protruded support portion surrounding the shoulder portion and forming a space encompassed by the dam, the adjacent dams having the support portions thereof interconnected;

mounting at least one photosensitive chip on each of the substrates and in the space encompassed by each of the dams, and electrically connecting the chip to the exposed terminals of the conductive traces;

cutting through the interconnected support portions of the adjacent dams and the substrate plate to separate apart the substrates; and

attaching a lid to the support portion of the dam on each of the substrates to seal the dam such that the chip is received in the space encompassed by the dam, the substrate and the lid.

16. The fabrication method of claim 15, further comprising implanting a plurality of solder balls on a side of each of the substrates opposite to the side mounted with the chip.

17. The fabrication method of claim 15, wherein the shoulder portion of the dam has a width of from 0.1 to 1 mm.

18. The fabrication method of claim 17, wherein the width of the shoulder portion is 0.5 mm.

19. The fabrication method of claim 15, wherein each of the terminals serves as a bond finger where a bonding wire is bonded to electrically connect the chip to the substrate.

20. The fabrication method of claim 15, wherein the encapsulation body is made of a resin compound.